



## Screening of Pregnant Women for Presence of Antibodies For Rubella Virus

### KEYWORDS

Pregnant women, IgG antibodies, ELISA.

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**ABSTRACT** *Background: The aim of this study was to assess the susceptibility of Rubella virus in pregnant women and provide scientific evidence for implementation of cost effective immunization guideline and policy for childbearing age women and adolescent girls.*

*Methods: This descriptive study involved 50 pregnant women attending Gangori Bazaar hospital, Jaipur. Blood samples were collected for serological testing by Elisa Method.*

*Results: Out of 50 pregnant women, 4% were found susceptible to Rubella Virus, among which 3.1% belonged to urban area and 5.5% belonged to rural area.*

### Introduction:

Rubella virus belongs to family *Togaviridae* and genus *Rubivirus*. The virus is transmitted by aerosol route. The incubation period is 2-3 weeks but the disease symptoms last only for 1-3 days. Rubella causes maculopapular rash with fever in children, which occasionally infects adults. It is a mild self limiting disease of worldwide distribution, however can be of serious consequences if contracted by a pregnant woman. It is teratogenic virus. Women contracting Rubella infection during the first trimester of pregnancy may lead to miscarriage / stillborn baby. If the baby survives it can lead to Congenital Rubella Syndrome (CRS) in newly born with severe heart disorders, blindness, deafness, mental retardation or other life threatening disorders. With estimated ~30 million annual pregnancies, the assumed CRS load is ~29000 cases per year (1). Approximately 10 to 15% of women may reach child bearing age without developing immunity against Rubella virus.

Inclusion of Rubella vaccine in the national immunization program has been implemented in less than one-third of the developing countries. There is a need for mechanisms to identify and vaccinate non-immune women. It is essential to evaluate the susceptibility of women (2). Moreover, periodic epidemics occur among children and spread to involve the small portion of susceptible adult women, leading to epidemics of CRS (3).

A single serologic IgG test may be used to determine the Rubella immune status of persons whose history of rubella disease or vaccination is unknown. The presence of serum IgG rubella-specific antibodies indicates immunity to rubella. Rubella-containing vaccines are not administered routinely in many countries, and in others, rubella-containing vaccine has been only recently added to the childhood immunization schedule (4). Immunity to Rubella in pregnant

women can indirectly hint at the risk of acquiring CRS.

### Materials and Methods:

**Study Area and Site:** This study was conducted in Department of Microbiology & Immunology of SMS Medical College, Jaipur.

**Study Design:** This was a Cross sectional, descriptive type of study.

**Study Population:** A total 50 pregnant women attending Anti Natal Clinic (ANC) at Gangori Bazaar Hospital, Jaipur.

**Inclusion Criteria:** Healthy ANC attendees.

**Exclusion Criteria:** Subjects with bad obstetric history, history of diabetes, history of hypertension, immune-compromised patient were excluded.

**Sample Collection:** Five ml blood samples were collected from pregnant women attending antenatal clinics after filling the questionnaire which was specifically designed for study get information regarding on socio-demographics, MMR/MR vaccination history and gravidity of women.

### Methodology:

The concentration of human IgG antibodies for Rubella was determined using commercial ELISA Kit (DiaPro) according to manufacturer's instruction. The calculation of results obtained by qualitative assay considered the optical density of each negative, positive and cut off control.

### Observation and Results:

Among the 50 samples collected 32 (64%) women belonged to urban and 18 (36%) belonged to rural area, 11(22%) women were illiterate, 16 (32%) had primary edu-

cation, 10 (20%) till secondary and 13 (26%) were graduates or postgraduates.

Among 50 only 4 (8%) women knew their immunization status about MMR. None of the pregnant mothers had history of Rubella vaccination in their reproductive age. All the women were found IgM negative and 2 (4%) women were found IgG negative. Among which 3.1% belonged to urban area and 5.5% to rural area. There was no correlation between their education and susceptibility. Susceptibility to Rubella virus was higher in rural area than urban.

**Table-1 showing susceptible participants on the basis of their residence:**

Residence	Number of participants	Susceptible population
Urban	64%	3.1%
Rural	36%	5.5%

#### Discussion:

To eliminate the severe impact on maternal and child health due to Rubella, it is important to know the immune status of the young women and immunize if required. The present study was done to assess immune status of pregnant women for Rubella attending a tertiary care center in Jaipur.

In the present study, susceptibility for Rubella was found to be 4%. Similar results were found for Rubella susceptibility in various studies conducted in India, 5.4% at Vellore by Black et al (5), 5.1% at Hyderabad by Bhaskaram et al (6). Susceptibility rates were similar in foreign countries also, 9.4% in U.S. reported by Hass DM et al (7), 9.4% from Saudi Arabia reported by Sharifa et al (8), 4% at Iran by Behman et al (9), 3.4% at Nigeria by Obijimi et al (10), 5% at Spain by Plans et al (11). Three studies from Delhi reported susceptibility of 12.8% by Ekta et al (12), 14.6% Gandhoke et al (13) and 21% by Deka et al (14).

In the present study, susceptibility for Rubella was higher in rural area. An a study conducted by Seth et al (15) at Delhi, the susceptibility for rubella was reported to be 20.5% for urban population and 30% for rural population. In a study conducted by Mahmoudi and co-workers at Mashad during 2001-2004 for evaluating Rubella immune status of women before and after vaccination, 1698 women before and 354 persons vaccination were studied. Immunity levels achieved before vaccination was 67.19% and post vaccination was 77.4% (16).

Several surveys investigated the Rubella susceptibility in different countries in similar setting and age specific profile of these viruses seems to have wide variation. Pre-conceptual screening and immunization of pregnant women are not yet adequate in India. Coonrod et al suggested that immunization should be part of Preconception care.

#### Conclusions:

More than 95% women had good immune status for Rubella. Though our study is limited to pregnant women it shows that women belonged to rural area were more susceptible. But for policy making for mass immunization of reproductive age group of women large scale studies are required.

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